



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,733	06/26/2003	Joshua Ocn	884.869US1	6513
21186	7590	03/08/2006	EXAMINER	
SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH 1600 TCF TOWER 121 SOUTH EIGHT STREET MINNEAPOLIS, MN 55402				CHEVALIER, ALICIA ANN
ART UNIT		PAPER NUMBER		
				1772

DATE MAILED: 03/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/607,733	OEN, JOSHUA	
	Examiner	Art Unit	
	Alicia Chevalier	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 28 October 2005.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-30 is/are pending in the application.
 4a) Of the above claim(s) 23-30 is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-23 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ . |

RESPONSE TO AMENDMENT

1. Claims 1-30 are pending in the application, claims 23-30 are withdrawn from consideration.

REJECTIONS

2. **The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.**

Claim Rejections - 35 USC § 102

3. Claims 1-3, 9, 10, 12-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Nelson et al. (U.S. Patent No. 5,328,087).

Regarding Applicant's claims 1 and 14, Nelson discloses an apparatus (*thermally and electrically conductive adhesive material, title*) comprising a heat source (*integrated circuit chip, col. 7, line 12*), a heat sink (*electrical interconnect substrate, col. 7, line 13 and col. 13, lines 64-68*) and a unitary layer of electrically non-conductive material (*thermosetting film, col. 9, lines 20-29*).

The electrically non-conductive material has a first surface that is adjacent the heat sink and has a second surface adjacent the heat source. The material further comprises a plurality of openings communicatively (*col. 9, lines 20-29*) coupled between the first surface and the second surface and the combined area of the plurality of openings are deemed to comprise a selected percentage of the first surface (*figures 7-10*).

Regarding Applicant's claims 2 and 3, Nelson discloses that selected ones of the plurality of openings comprise a regular geometric shape which is substantially circular (*figure 7*).

Regarding Applicant's claims 9 and 15, Nelson discloses that the electrically non-conductive material is a polymer (*col. 9, lines 20-29*).

Regarding Applicant's claim 10 and 17, Nelson discloses that a thermal interface material located between the unitary layer of electrically non-conductive and the heat sink (*col. 7, lines 10-12*).

Regarding Applicant's claim 12, Nelson discloses that the unitary layer if electrically non-conductive material comprises a plurality of glass beads (*col. 10, line 38*).

Regarding Applicant's claim 13, Nelson discloses a thermally conductive material located in selected ones of the plurality of openings the thermally conductive material selected from at least one of a solid, a liquid, and a paste (*col. 7, lines 47-54*).

Regarding Applicant's claim 16, Nelson discloses that the unitary layer of electrically non-conductive material has a substantially uniform thickness of about 0.05 mm (*col. 9, lines 33-34*).

Regarding Applicant's claims 18 and 19, Nelson discloses that the heat source comprises a die or and integrated circuit chip (*col. 7, line 12*).

Regarding Applicant's claim 20, Nelson discloses that the heat sink comprises a heat spreader (*electrical interconnect substrate, col. 7, line 13 and col. 13, lines 64-68*).

4. Claims 1, 11, 14 and 18-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Bunyan (U.S. Patent No. 6,946,190).

Regarding Applicant's claims 1 and 14, Nelson discloses an apparatus (*thermal management materials, title*) comprising a heat source (*integrated circuit chip, col. 1, lines 18-19*), a heat sink (*col. 1, line 21*) and a unitary layer of electrically non-conductive material (*col. 10, lines 22-23*).

The electrically non-conductive material has a first surface that is adjacent the heat sink and has a second surface adjacent the heat source. The material further comprises a plurality of openings communicatively (*col. 10, line 18*) coupled between the first surface and the second surface and the combined area of the plurality of openings are deemed to comprise a selected percentage of the first surface.

Regarding Applicant's claim 11, Nelson discloses that the electrically non-conductive material is a non-woven (*col. 10, lines 22-23*).

Regarding Applicant's claims 18 and 19, Nelson discloses that the heat source comprises a die or and integrated circuit chip (*col. 1, lines 18-19*).

Regarding Applicant's claim 20, Nelson discloses that the heat sink comprises a heat spreader (*col. 1, line 21*).

5. Claims 4-7, 21 and 22 rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson.

Nelson fails to disclose that the combined open area of the plurality of openings comprises at least about 90% but no more than about 95% of the first surface and that the openings have non-circular geometry.

It would have been an obvious matter of design choice to change the shape of the openings, since a modification would have involved a mere change in shape of the opening. A change in size or shape is generally recognized as being within the level of ordinary skill in the art, absent unexpected results. MPEP 2144.04 (I) and (IV).

The exact percent open area of the openings is deemed to be a result effective variable with regard to the heat transfer. It would require routine experimentation to determine the optimum value of a result effective variable, such as percent open area, in the absence of a showing of criticality in the claimed percent open. *In re Boesch*, 205 USPQ 215 (CCPA 1980), *In re Woodruff*, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). One of ordinary skill in the art would have been motivated by optimize the percent open area in order to maximize the heat transfer.

ANSWERS TO APPLICANT'S ARGUMENTS

6. Applicant's arguments in the response filed October 28, 2005 regarding the 35 U.S.C. 102 rejections over Dinter, Crandall, Hisinaka and Brady of record have been carefully considered but are moot since the rejections have been withdrawn.

Conclusion

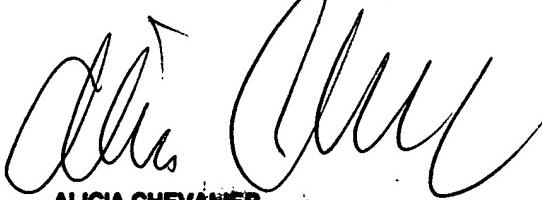
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia Chevalier whose telephone number is (571) 272-1490. The examiner can normally be reached on Monday through Friday from 8:00 am to 4:00 pm.

Art Unit: 1772

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (571) 272-1498. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

ac
3/6/06


ALICIA CHEVALIER
PRIMARY EXAMINER